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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/788,621	02/21/2001	Hikaru Kouta	Q63282	4578

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EXAMINER	
KAO, CHIH CHENG G	

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 03/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

K.D

Office Action Summary	Application No.	Applicant(s)	
	09/788,621	KOUTA ET AL.	
	Examiner	Art Unit	
	Chih-Cheng Glen Kao	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 November 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,6-8,10,13-18,25 and 26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,6-8,10,13-18,25 and 26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 February 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/21/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The proposed drawings sent 11/21/03 have been approved. However, corrected replacement drawings are still required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Claim Objections

2. Claim 26 is objected to because it depends from a canceled claim. This objection may be obviated by changing the dependency of claim 26 from claim 19 to claim 25. For purposes of examination, the claim has been treated as such. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 2, 6, 7, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo et al. (Optics Letters) in view of Bilodeau et al. (US Patent 5495548).

4. With regards to claim 1, Kondo et al. discloses a method of modifying a refractive index or a waveguide having a core doped with GeO_2 and a clad section (Fig. 1) including condensing

rays having a pulse width not more than 30 pico-seconds (Page 646, col. 2, line 4) using an objective lens (Fig. 1, lens next to "20X") to at least one of the core and clad section (Page 646, col. 2, lines 1-5, and Fig. 1), wherein the rays are irradiated, while scanned along the core at least one at a time, to the core section to modify the refractive index (Fig. 1, "XYZ-stage"), and wherein the rays are irradiated for heating as well as modifying the refractive index, thereby making thermal treatment unnecessary (Page 648, col. 1, lines 3-25).

However, Kondo et al. does not disclose saturating the change of the refractive index.

Bilodeau et al. teaches saturating the change of the refractive index (Fig. 2).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the method of Kondo et al. with saturating the change of refractive index of Bilodeau et al., since one would be motivated to do this to create a sharper grating than one that was changed only a fraction of that amount (Fig. 2) as implied from Bilodeau et al.

5. With regards to claim 2, Kondo et al. further discloses laser rays having photon energy lower than half of the band-gap energy of a material of the clad section (Page 646, col. 1, last paragraph, "clad glasses were Ge-doped and pure-silica glass", and col. 2, lines 1-5, "800 nm").

6. With regards to claim 6, Kondo et al. further discloses a core section of a three dimensional-structure (Fig. 1) and rays irradiated to the bottom part of the core to modify the refractive index without changing the top part of the core (Fig. 1 flipped on its side).

7. With regards to claim 7, Kondo et al. further discloses the refractive index elevated by increasing a density of the irradiated part (Page 648, col. 1, lines 10-14).

8. With regards to claim 10, Kondo et al. in view of Bilodeau et al. suggests a method as recited above.

However, Kondo et al. does not specifically disclose rays having a power density for saturating the change of the refractive index of the core section.

Bilodeau et al. would necessarily have rays having a power density for saturating the change of the refractive index of the core section (Fig. 2, and col. 2, liens 45-55).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to further modify the method of Kondo et al. to employ the power density of Bilodeau et al., since one would be motivated to have the necessary energy needed to reach a particular refractive index as implied from Bilodeau et al. (Fig. 2, and col. 2, lines 45-55).

9. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo et al. in view of Bilodeau et al. as applied to claim 1 above, and further in view of Kircher (US Patent 4537469).

Kondo et al. in view of Bilodeau et al. suggests a method as recited above.

However, Kondo et al. does not disclose the refractive index reduced by decreasing a density.

Kircher teaches the refractive index reduced by decreasing a density (col. 3, lines 30-40).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the suggested method of Kondo et al. in view of Bilodeau et al. with the reducing refractive index by decreasing a density of Kircher, since one would be motivated to do this for better light transmission in an optical fiber as implied from Kircher (col. 3, lines 30-40).

10. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo et al. in view of Bilodeau et al. as applied to claim 1 above, and further in view of Kershaw (US Patent 6154591).

Kondo et al. in view of Bilodeau et al. suggests a method as recited above.

However, Kondo et al. does not disclose the shape of the core changed to have a taper.

Kershaw teaches the shape of the core changed to have a taper (col. 2, lines 57-63).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the suggested method of Kondo et al. in view of Bilodeau et al. with the tapered core of Kershaw, since one would be motivated to do this to reduce cavity losses as implied from Kershaw (col. 2, lines 57-63).

11. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo et al. in view of Bilodeau et al. as applied to claim 1 above, and further in view of Koops (US Patent 5982962).

Kondo et al. in view of Bilodeau et al. suggests a method as recited above.

However, Kondo et al. does not disclose a grating for diffracting rays in the core to any direction.

Koops teaches a grating for diffracting rays in the core to any direction (Fig. 10).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the suggested method of Kondo et al. in view of Bilodeau et al. with the diffraction grating of Koops et al., since one would be motivated to use it for better coupling light between one fiber and a plurality of fibers as implied from Koops et al. (col. 1, lines 25-30).

12. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo et al. in view of Bilodeau et al. as applied to claim 1 above, and further in view of Starodubov (US Patent 5881188).

Kondo et al. in view of Bilodeau et al. suggests a method as recited above.

However, Kondo et al. does not disclose a planar waveguide.

Starodubov teaches a planar waveguide (col. 3, lines 53-54).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the suggested method of Kondo et al. in view of Bilodeau et al. with the planar waveguide of Starodubov, since planar waveguides and optical fibers are considered art-recognized equivalents known in the art. It would have been within ordinary skill in the art to substitute one for the other as shown by Starodubov (col. 3, lines 53-54). One would be motivated to incorporate a planar waveguide to put them within integrated circuits or on top of surfaces so the waveguide does not roll around like a fiber

13. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo et al. in view of Bilodeau et al. as applied to claim 1 above, and further in view of Modavis et al. (US Patent 5647040).

Kondo et al. in view of Bilodeau et al. suggests a method as recited above.

However, Kondo et al. does not disclose a coupler subjected to refractive index modification.

Modavis et al. teaches a coupler subjected to refractive index modification (Abstract).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the suggested method of Kondo et al. in view of Bilodeau et al. with the coupler for refractive index modification of Modavis et al., since one would be motivated to change the refractive index of a coupler for better tuning the coupler to a selected coupling frequency (Abstract) as shown by Modavis et al.

14. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo et al. in view of Bilodeau et al. as applied to claim 1 above, and further in view of Albrecht et al. (WO 99/52003).

Kondo et al. in view of Bilodeau et al. suggests a method as recited above.

However, Kondo et al. does not disclose an array grating for WDM telecommunications binding the divided rays and modifying the refractive index such that a ray having a specified wavelength is coupled to the waveguide.

Albrecht et al. teaches an array grating for WDM telecommunications binding the divided rays (Fig. 1, #101, 102, and 103) and modifying the refractive index such that a ray having a specified wavelength is coupled to the waveguide (Fig. 1, #3).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the suggested method of Kondo et al. in view of Bilodeau et al. with the array grating and modification of the refractive index of Albrecht et al., since one would be motivated to use these for better demultiplexing of signals (Fig. 1, input and output of #42) as shown by Albrecht et al.

See US Patent 6591034 for a translation of WO 99/52003.

15. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo et al. in view of Bilodeau et al. as applied to claim 1 above, and further in view of Komatsu (US Patent 6192170).

Kondo et al. in view of Bilodeau et al. suggests a method as recited above.

However, Kondo et al. does not disclose a fiber grating for diffracting a ray with a specified wavelength and the refractive index modified by the specified wavelength.

Komatsu teaches a fiber grating for diffracting a ray with a specified wavelength (Fig. 2, #4) and the refractive index modified by the specified wavelength (col. 3, lines 1-9).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the suggested method of Kondo et al. in view of Bilodeau et al. with a grating modification of Komatsu., since one would be motivated to incorporate this for

better maximizing the optical power at a desired wavelength (col. 3, lines 5-9) as shown by Komatsu.

16. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo et al. in view of Hill et al. (US Patent 5216739).

Kondo et al. discloses an apparatus for modifying a refractive index of an optical waveguide (Fig. 1) including a stage for holding and moving the device in x, y, and z direction (Fig. 1, "XYZ-stage"), a lasing section for emitting rays having a pulse width not more than 30 pico-seconds (Fig. 1, "Laser"), and an optical system section for irradiating the rays on the core section of the device (Fig. 1, "Scanning").

However, Kondo et al. does not disclose a surface shape of the optical waveguide being convex to act as a lens to focus rays to the core of the waveguide.

Hill et al. teaches a surface shape of the optical waveguide being convex to act as a lens to focus rays to the core of the waveguide (Fig. 5A, and col. 5, lines 37-42).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the apparatus of Kondo et al. with the lens surface shape of Hill et al., since one would be motivated to use this to better focus the light as implied from Hill et al. (col. 5, lines 37-42).

17. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo et al. in view of Hill et al. as applied to claim 25 above, and further in view of Katayama et al. (US Patent 5617460).

Kondo et al. in view of Hill et al. suggests an apparatus as recited above.

However, Kondo et al. does not disclose a chamber for the stage, lasing, and optical system.

Katayama et al. teaches a chamber for at least the stage and optical system (Fig. 4, #12).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the suggested apparatus of Kondo et al. in view of Hill et al. with the chamber of Katayama et al., since one would be motivated to use a chamber to prevent external radiation from interfering with the method of changing the refractive index using radiation (Fig. 4) as implied from Katayama et al.

Although Katayama et al. does not seem to specifically disclose the chamber for the lasing section, it would have been obvious, to one having ordinary skill in the art at the time the invention was made, to extend the chamber to the lasing section, since one would be motivated to use a chamber to prevent external radiation from interfering with the method of changing the refractive index using radiation (Fig. 4) as implied from Katayama et al.

Response to Arguments

18. Applicant's arguments with respect to claims 1, 2, 6-8, 10, 13-18, 25, and 26 have been considered but are moot in view of the new ground(s) of rejection.

19. Applicant's arguments filed 11/21/03 have been fully considered but they are not persuasive.

With regards to claim 1, Kondo et al. discloses a pulse width not more than 30 pico-seconds (Page 646, col. 2, line 4).

With regards to claim 6, Kondo et al. discloses a three dimensional structure (Fig. 1) as specifically recited in claim 6. Although stacked layers are recited in the claim, this recitation is in the alternative form. Thus, the core includes stacked layers or a three-dimensional structure.

With regards to claim 8, a density is decreased as shown by Kircher (col. 3, lines 30-40).

With regards to claim 13, Kershaw does teach the shape of the core changed to have a taper (col. 2, lines 57-63).

With regards to claim 14, Koops et al. does teach a grating for diffracting rays in the core to any direction (Fig. 10).

With regards to claim 25 and Hill et al., the round surface of the optical fiber is the convex portion that acts as a lens to focus the rays to the core of the waveguide (Fig. 5A, and col. 5, lines 37-42).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Cheng Glen Kao whose telephone number is (571) 272-2492. The examiner can normally be reached on M-F 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gk

EDWARD J. GLICK
SUPERVISORY PATENT EXAMINER